

## REMARKS

Claims 1-53 are pending in the present application. In the Office Action mailed October 5, 2005, the Examiner took the following action: (1) objected to the drawings; (2) objected to the Information Disclosure Statement; (3) objected to the specification; (4) objected to the claims due to informalities; (5) rejected claims 1-4, 6-19, 21-23, 25-37, 40-42, and 45-53 under 35 U.S.C. §102(b) as being anticipated by Sarh (U.S. 2002/0050043); (6) rejected claims 5, 24 and 39 under 35 U.S.C. 103(a) as being unpatentable over Sarh; (7) rejected claims 20 and 38 under 35 U.S.C. 103(a) as being unpatentable over Sarh in view of Wester (U.S. 4,388,890); and (8) rejected claims 43 and 44 under 35 U.S.C. 103(a) as being unpatentable over Sarh in view of Wheetley (U.S. 5,468,099). Applicant respectfully requests reconsideration of the application in view of the foregoing amendments and the following remarks.

### *I. Objection to the Drawings*

The Examiner objected to the drawings on grounds that the text and reference numerals were unclear. Applicant submits concurrently herewith revised formal drawings to remedy the deficiencies noted by the Examiner. No new matter has been added. Applicant respectfully requests reconsideration and withdrawal of the objections to the drawings.

### *II. Objection to the Information Disclosure Statement*

The Examiner objected to the Information Disclosure Statement filed on February 18, 2005 due to informalities. Applicant hereby recertifies, pursuant to 37 CFR 1.97(e), that each item of information contained in the Information Disclosure Statement filed on February 18, 2005, was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the Information Disclosure Statement filed on February 18, 2005.

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Furthermore, the Examiner notes an informality regarding reference number 34. More specifically, the reference DE 508347 was inadvertently and erroneously referred to as DE 508647 in the Information Disclosure Statement filed on February 18, 2005. Applicant respectfully requests an Examiner's Amendment to the Information Disclosure Statement filed on February 18, 2005 to correct the noted informality regarding reference number 34.

For the foregoing reasons, Applicant respectfully requests reconsideration and withdrawal of the objections to the Information Disclosure Statement filed on February 18, 2005.

### *III. Objection to the Specification*

The Examiner objected to the specification on grounds that the title is not descriptive. Applicant has amended the title to correct the deficiency noted by the Examiner. Accordingly, Applicant respectfully requests reconsideration and withdrawal of this objection.

### *IV. Objection to the Claims*

The Examiner objected to the claims due to informalities. Applicant has amended the claims to correct the deficiencies noted by the Examiner. More specifically, claims 1, 14-16, 18-21, and 32-33 have been amended to replace the term "adapted" with the term -- configured --, and claim 16 has been amended to more distinctly claim the subject matter regarded as the invention. Accordingly, Applicant respectfully requests reconsideration and withdrawal of the objections to the claims.

### *V. Rejections Under §102(b) and §103(a)*

Claims 1-4, 6-19, 21-23, 25-37, 40-42, and 45-53 were rejected under 35 U.S.C. §102(b) as being anticipated by Sarh (U.S. 2002/0050043). Similarly, claims 5, 24 and 39 were rejected under 35 U.S.C. 103(a) as being unpatentable over Sarh, claims 20 and 38 were rejected under

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35 U.S.C. 103(a) as being unpatentable over Sarh in view of Wester (U.S. 4,388,890), and claims 43 and 44 were rejected under 35 U.S.C. 103(a) as being unpatentable over Sarh in view of Wheetley (U.S. 5,468,099). Applicant respectfully requests reconsideration in view of the foregoing amendments and the following remarks.

Claims 1-10 and 12-20

In one embodiment, as recited in claim 1, Applicant teaches a sensing system configured to locate a desired position for a manufacturing operation on a workpiece, comprising a first portion including a magnet having a magnetic field emanating therefrom and at least one field-directing member configured to provide a shaped magnetic field portion of the magnetic field, *the shaped magnetic field portion including an approximately partially-spherical portion at least partially extending through the workpiece and outwardly beyond a second surface of the workpiece*; and a second portion including *a magnetic field sensor moveable through at least a portion of the approximately partially-spherical portion of the shaped magnetic field portion extending outwardly beyond the second surface*, the magnetic field sensor being configured to sense a characteristic of the approximately partially-spherical portion indicative of the desired position for the manufacturing operation. (emphasis added).

Sarh (US 2002/0050043)

Sarh teaches a machine 12 having an end effector 24 positioned on an outside surface of a workpiece, and a hand held tool 14 positioned adjacent an inside surface of the workpiece. As best shown in Figures 5 and 5A, according to Sarh, the end effector 24 includes an electromagnet 26 operable to generate either a relatively weak magnetic field for positioning of the tool 14, or a relatively strong magnetic field used for clamping. (Paragraph [0025]). The tool 14 includes a plurality of sensors 32 (e.g. Hall effect sensors) for detecting the magnetic field from the electromagnet 26. (Paragraph [0029]). According to Sarh, “the electromagnet 26 is

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advantageously operable to generate a magnetic field that is symmetric along all axes that are perpendicular to the center axis of the electromagnet.” (Paragraph [0030]).

Sarh does not disclose, teach, or fairly suggest the apparatus recited in claim 1. More specifically, Sarh fails to teach or fairly suggest an apparatus that includes “a magnet having a magnetic field emanating therefrom and at least one field-directing member configured to provide a shaped magnetic field portion of the magnetic field, *the shaped magnetic field portion including an approximately partially-spherical portion at least partially extending through the workpiece and outwardly beyond a second surface of the workpiece*; and a second portion including *a magnetic field sensor moveable through at least a portion of the approximately partially-spherical portion of the shaped magnetic field portion extending outwardly beyond the second surface*” as recited in claim 1. There is no teaching or suggestion in Sarh of a *shaped magnetic field portion including an approximately partially-spherical portion at least partially extending through the workpiece and outwardly beyond a second surface of the workpiece*.

In fact, Sarh teaches away from a shaped magnetic field portion including an approximately partially-spherical portion at least partially extending through the workpiece and outwardly beyond a second surface of the workpiece. Instead, Sarh expressly teaches that “the electromagnet 26 is advantageously operable to generate a magnetic field that is symmetric along all axes that are perpendicular to the center axis of the electromagnet.” (Paragraph [0030]). In other words, Sarh expressly teaches that the magnetic field is a cylindrical magnetic field, rather than an approximately partially-spherical portion, as recited in claim 1.

For the foregoing reasons, claim 1 is allowable over Sarh. Claims 2-10 and 12-20 depend from claim 1 and are allowable over Sarh for the same reasons as claim 1 and also due to additional limitations recited in those claims. For example, claim 5 recites the sensing system of Claim 1 wherein the at least one field-directing member includes a conically-shaped field-directing portion. Similarly, claim 7 recites the sensing system of Claim 1 wherein the at least one field-directing member includes a frustum-shaped field-directing portion. These additional

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limitations are also not taught, disclosed, or fairly suggested by Sahr, as such field-directing members are configured to provide the approximately partially-spherically shaped portion rather than a cylindrical magnetic field portion as taught by Sahr.

Wester (U.S. 4,388,890)

Wester teaches a device for locating in buildings the exact position of a hidden object. According to Wester, a first magnet 9 is positioned on a first side of a building unit, and a second magnet 9a is positioned on a second side of the building unit. Due to the magnetic attraction of the first and second magnets 9, 9a, the magnets 9, 9a position themselves opposingly on the first and second sides of the building unit. (2:9-10).

Wheetley (U.S. 5,468,099)

Wheetley teaches a robotic drilling machine 100 that is moveable over a workpiece using a pair of drive belts 104, 106, each drive belt 104, 106 having a plurality of adhesion devices 112 that adhere to the workpiece.

Wester and Wheetley fail to remedy the above-noted absent teachings of Sarh. More specifically, the cited references (Sarh, Wester, and Wheetley), either singly or in combination, fail to disclose, teach, or fairly suggest the apparatus recited in claims 1-10 and 12-20. Accordingly, Applicant respectfully submits that claims 1-10 and 12-20 are allowable.

Claims 21-26 and 28-34

Similarly, claim 21 recites a manufacturing assembly, comprising a manufacturing tool configured to perform a manufacturing operation on a workpiece; and a sensing system configured to be operatively engaged with the workpiece, wherein the sensing system includes: *a first portion including a magnet having a magnetic field emanating therefrom and at least one field-directing member configured to provide a shaped magnetic field portion of the magnetic field, the shaped magnetic field portion including an approximately partially-spherical portion at*

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*least partially extending through the workpiece and outwardly beyond a second surface of the workpiece; and a second portion including a magnetic field sensor moveable through at least a portion of the approximately partially-spherical portion of the shaped magnetic field portion extending outwardly beyond the second surface, the magnetic field sensor being configured to sense a characteristic of the approximately partially-spherical portion indicative of the desired position for the manufacturing operation.* (emphasis added).

As described more fully above, the cited references fail to disclose, teach, or fairly suggest the apparatus recited in claim 21. More specifically, the cited references fail to teach or fairly suggest an apparatus that includes “a magnet having a magnetic field emanating therefrom and at least one field-directing member configured to provide a shaped magnetic field portion of the magnetic field, *the shaped magnetic field portion including an approximately partially-spherical portion at least partially extending through the workpiece and outwardly beyond a second surface of the workpiece; and a second portion including a magnetic field sensor moveable through at least a portion of the approximately partially-spherical portion of the shaped magnetic field portion extending outwardly beyond the second surface*” as recited in claim 21.

In fact, Sarh teaches away from a shaped magnetic field portion including an approximately partially-spherical portion at least partially extending through the workpiece and outwardly beyond a second surface of the workpiece. Instead, Sarh expressly teaches that “the electromagnet 26 is advantageously operable to generate a magnetic field that is symmetric along all axes that are perpendicular to the center axis of the electromagnet.” (Paragraph [0030]). In other words, Sarh expressly teaches that the magnetic field is a cylindrical magnetic field, rather than an approximately partially-spherical portion, as recited in claim 21.

For the foregoing reasons, claim 21 is allowable over the cited references. Claims 22-26 and 28-34 depend from claim 21 and are allowable over the cited references for the same reasons as claim 21 and also due to additional limitations recited in those claims.

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Claims 35-45 and 47-53

Similarly, claim 35 recites a method of performing a manufacturing operation on a workpiece, the method comprising: *providing a shaped magnetic field portion including an approximately partially-spherical portion originating from a first side of the workpiece and extending through the workpiece and outwardly from a second side of the workpiece; traversing a sensor along a first path at least partially through the approximately partially-spherical portion of the shaped magnetic field portion extending outwardly from the second side of the workpiece; sensing a characteristic of the approximately partially-spherical portion; and determining a desired location for performing the manufacturing operation on the workpiece based on the sensed characteristic of the approximately partially-spherical portion.* (emphasis added).

Again, as described more fully above, the cited references fail to disclose, teach, or fairly suggest the method recited in claim 35. More specifically, the cited references fail to teach or fairly suggest a method that includes “*providing a shaped magnetic field portion including an approximately partially-spherical portion originating from a first side of the workpiece and extending through the workpiece and outwardly from a second side of the workpiece; traversing a sensor along a first path at least partially through the approximately partially-spherical portion of the shaped magnetic field portion extending outwardly from the second side of the workpiece*” as recited in claim 35.

For the foregoing reasons, claim 35 is allowable over the cited references. Claims 36-45 and 47-53 depend from claim 35 and are allowable over the cited references for the same reasons as claim 35 and also due to additional limitations recited in those claims.

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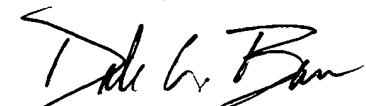
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## CONCLUSION

For the foregoing reasons, Applicant respectfully requests reconsideration and withdrawal of the rejections of claims 1-10, 12-26, 28-45, and 47-53. If there are any remaining matters that may be handled by telephone conference, the Examiner is kindly invited to call the undersigned.

Respectfully submitted,

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Enclosures: Amended Formal Drawings

## MAIL CERTIFICATE

I hereby certify that this communication is being deposited with the United States Postal Service via first class mail under 37 C.F.R. § 1.08 on the date indicated below addressed to: MAIL STOP AMENDMENTS, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

December 29, 2005  
Date of Deposit

Wendy Saxby  
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